CHICAGO ELECTRIC® welding systems

WELDER DUAL MIG 200

Model 93804

ASSEMBLY AND OPERATING INSTRUCTIONS

Due to continuing improvements, actual product may differ slightly from the product described herein.

Distributed Exclusively by HARBOR FREIGHT TOOLS®

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TO PREVENT SERIOUS INJURY, READ AND UNDERSTAND ALL WARNINGS AND INSTRUCTIONS BEFORE USE.

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For technical questions, please call 1-800-444-3353.

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PRODUCT SPECIFICATIONS

Welding Current	30 ~ 200 Amps
Welding Capacity	For welding 0.02" to 0.36" thickness
Duty Cycle	100% @ 80 Amps / 15% @ 200 Amps (Welds $1^1/_2$ minutes out of 10 minutes @ full amperage)
Power Consumption	230 Volt / 60 Hz / Single Phase / 38 Amps
Open Voltage	16-34
Required Power Plug Type	3-Prong, 220 VAC, polarized, twist lock (not included) NEMA #L6-50 or equivalent
Power Cord Rating	8 AWG x 3C
Gas Inlet Size	1/4"
Gas Flow Rate	10.5 ~ 31.75 CFH (Cubic Feet per Hour)
Ground Cable	6'7" Long with grounding clamp
Torch Power Cable	8'7" Long
Thermal Overload Protection (with Light)	Automatic shutdown and restart after cool down
Wire Size	0.03" to 0.045" (0.8mm to 1.2mm)
Torch Tip	0.8
Overall Dimensions	26-1/2" L x 10" W x 21" H
Net Weight	84.6 Pounds

SAVE THIS MANUAL

You will need this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures, parts list and assembly diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep this manual and invoice in a safe and dry place for future reference.

GENERAL SAFETY RULES

⚠ WARNING!

READ AND UNDERSTAND ALL INSTRUCTIONS
Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.
SAVE THESE INSTRUCTIONS

WORK AREA

1. **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
2. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
3. **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control. Protect others in the work area from debris such as chips and sparks. Provide barriers or shields as needed.

ELECTRICAL SAFETY

4. **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.** If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.

5. **Avoid body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerators.** There is an increased risk of electric shock if your body is grounded.

6. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.

7. **Do not abuse the Power Cord. Never use the Power Cord to carry the tools or pull the Plug from an outlet. Keep the Power Cord away from heat, oil, sharp edges, or moving parts. Replace damaged Power Cords immediately.** Damaged Power Cords increase the risk of electric shock.

8. **When operating a power tool outside, use an outdoor extension cord marked "W-A" or "W".** These extension cords are rated for outdoor use, and reduce the risk of electric shock.

PERSONAL SAFETY

9. **Stay alert. Watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.

10. **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.

11. **Avoid accidental starting. Be sure the Power Switch is off before plugging in.** Carrying power tools with your finger on the Power Switch, or plugging in power tools with the Power Switch on, invites accidents.

12. **Remove adjusting keys or wrenches before turning the power tool on.** A wrench or a key that is left attached to a rotating part of the power tool may result in personal injury.

13. **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the power tool in unexpected situations.

14. **Always wear eye, hearing, and breathing protection.** For welding safety equipment, refer to number **9** on page **6**.

TOOL USE AND CARE

15. **Use clamps (not included) or other practical ways to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.

16. **Do not force the tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.

17. **Do not use the power tool if the Power Switch does not turn it on or off.** Any tool that cannot be controlled with the Power Switch is dangerous and must be replaced.

18. **Disconnect the Power Cord Plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce the risk of starting the tool accidentally.

19. **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.

20. **Maintain tools with care. Keep cutting tools sharp and clean.** Properly maintained tools with a sharp cutting edge are less likely to bind and are easier to control. Do not use a damaged tool. Tag damaged tools "Do not use" until repaired.

21. **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool's operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.

22. **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool may become hazardous when used on another tool.

SERVICE

23. **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury.

24. **When servicing a tool, use only identical replacement parts. Follow instructions in the *"Inspection, Maintenance, And Cleaning"* section of this manual.** Use of unauthorized parts or failure to follow maintenance instructions may create a risk of electric shock or injury.

SPECIFIC SAFETY RULES

1. **Ground this product.** This Welder requires the attachment and use of a UL®-listed, 220 volt, grounded, 3-prong, electrical Power Cord Plug (not included). Only a qualified electrician should install the Power Cord Plug. Never remove the grounding prong or modify the Power Cord Plug in any way. Do not use adapter plugs with this product. To comply with the National Electric Code, and to provide additional protection from the risk of electrical shock, this product should only be connected to a 220 volt, 3-hole outlet that is properly grounded.

2. **Maintain labels and nameplates on the Welder.** These carry important information. If unreadable or missing, contact Harbor Freight Tools for a replacement.

3. **Avoid unintentional starting.** Make sure you are prepared to begin work before turning on the Welder.

4. **Do not force the Welder.** This tool will do the work better and safer at the speed and capacity for which it was designed.

5. **Never leave the Welder unattended when it is plugged into an electrical outlet.** Turn off the tool, and unplug it from its electrical outlet before leaving.

6. **Industrial applications must follow OSHA guidelines.**

7. **Never stand on the Welder.** Serious injury could result if the Welder is tipped or if hot surfaces are accidently contacted.

8. **Maintain a safe working environment.** Keep the work area well lit. Make sure there is adequate surrounding workspace. Always keep the work area free of obstructions, grease, oil, trash, and other debris. Do not use a power tool in areas near flammable chemicals, dusts, and vapors. Do not use this product in a damp or wet location.

9. **Prevent eye injury and burns.** Wearing and using ANSI-approved personal safety clothing and safety devices reduce the risk for injury.
   - Wear ANSI-approved safety impact eye goggles with a welding helmet with protective lens.
   - Leather leggings, fire resistant shoes or boots should be worn when using this product. Do not wear pants with cuffs, shirts with open pockets, or any clothing that can catch and hold molten metal or sparks.
   - Keep clothing free of grease, oil, solvents, or any flammable substances. Wear dry, insulating gloves and protective clothing.
   - Wear an approved head covering to protect the head and neck. Use aprons, cape, sleeves, shoulder covers, and bibs designed and approved for welding and cutting procedures.
   - When welding/cutting overhead or in confined spaces, wear flame resistant ear plugs or ear muffs to keep sparks out of ears.

10. **Prevent accidental fires.** Remove any combustible material from the work area.

- When possible, move the work to a location well away from combustible materials. If relocation is not possible, protect the combustibles with a cover made of fire resistant material.

- Remove or make safe all combustible materials for a radius of 35 feet (10 meters) around the work area. Use a fire resistant material to cover or block all open doorways, windows, cracks, and other openings.
- Enclose the work area with portable fire resistant screens. Protect combustible walls, ceilings, floors, etc., from sparks and heat with fire resistant covers.
- If working on a metal wall, ceiling, etc., prevent ignition of combustibles on the other side by moving the combustibles to a safe location. If relocation of combustibles is not possible, designate someone to serve as a fire watch, equipped with a fire extinguisher, during the cutting process and for at least one half hour after the cutting is completed.
- Do not weld or cut on materials having a combustible coating or combustible internal structure, as in walls or ceilings, without an approved method for eliminating the hazard.
- Do not dispose of hot slag in containers holding combustible materials. Keep a fire extinguisher nearby and know how to use it.
- After spot welding, make a thorough examination for evidence of fire. Be aware that easily-visible smoke or flame may not be present for some time after the fire has started. Do not weld or cut in atmospheres containing dangerously reactive or flammable gases, vapors, liquids, and dust. Provide adequate ventilation in work areas to prevent accumulation of flammable gases, vapors, and dust. Do not apply heat to a container that has held an unknown substance or a combustible material whose contents, when heated, can produce flammable or explosive vapors. Clean and purge containers before applying heat. Vent closed containers, including castings, before preheating, welding, or cutting.

11. **Avoid overexposure to fumes and gases.** Always keep your head out of the fumes. Do not breathe the fumes. Use enough ventilation or exhaust, or both, to keep fumes and gases from your breathing zone and general area.

- Where ventilation is questionable, have a qualified technician take an air sampling to determine the need for corrective measures. Use mechanical ventilation to improve air quality. If engineering controls are not feasible, use an approved respirator.
- Work in a confined area only if it is well ventilated, or while wearing an air-supplied respirator.
- Follow OSHA guidelines for Permissible Exposure Limits (PEL's) for various fumes and gases.
- Follow the American Conference of Governmental Industrial Hygienists recommendations for Threshold Limit Values (TLV's) for fumes and gases.

- Have a recognized specialist in Industrial Hygiene or Environmental Services check the operation and air quality and make recommendations for the specific welding or cutting situation.

Inhalation Hazard

Welding Produces TOXIC FUMES and GASSES.

Exposure to welding gasses can increase the risk of developing certain cancers, such as cancer of the larynx and lung cancer. Also, some diseases that may be linked to exposure to welding gasses or fumes are:

- **Early onset of Parkinson's Disease**
- **Damage to the reproductive organs**
- **Inflammation of the small intestine or stomach**
- **Respiratory diseases such as emphysema, bronchitis or pneumonia**
- **Heart Disease**
- **Ulcers**
- **Kidney damage**

Safety precautions, such as using natural or forced air ventilation and wearing a NIOSH-approved respirator, are ESSENTIAL to reduce the risk of developing the above illnesses.

12. **Read and understand all instructions and safety precautions as outlined in the manufacturer's manual for the material you will weld or cut.**

13. **Do not touch live electrical parts**. Wear dry, insulating gloves. Do not touch electrode or conductor tong with bare hand. Do not wear wet or damaged gloves.

14. **Protect yourself from electric shock.** Do not use outdoors. Insulate yourself from the workpiece and ground. Use nonflammable, dry insulating material if possible, or use dry rubber mats, dry wood or plywood, or other dry insulating material big enough to cover your full area of contact with the work or ground.

15. **Ensure that the unit is placed on a stable location before use.** If this unit falls while plugged in, severe injury, electric shock, or fire may result.

16.

Cylinders can explode when damaged:

- Never weld on a pressurized or a closed cylinder.
- Never lay a welding torch on a cylinder.
- Never allow a welding electrode to touch the cylinder.
- Keep cylinders away from any electrical circuits, including welding circuits.
- Keep protective cap in place over the valve except when the cylinder is in use.
- Use only correct gas shielding equipment designed specifically for the type of welding you will do. Maintain this equipment properly.
- Always protect gas cylinders from heat, being struck, physical damage, slag, flames, sparks, and arcs.
- Always use proper procedures to move cylinders.

17. **Use the right tool for the job.** Do not attempt to force small equipment to do the work of larger industrial equipment. There are certain applications for which this Welder was designed. It will do the job better and more safely at the rate for which it was intended. Do not modify this Welder, and do not use this Welder for a purpose for which it was not intended.

18. ⚠ **WARNING!** People with pacemakers should consult their physician(s) before using this product. Electromagnetic fields in close proximity to a heart pacemaker could cause interference to or failure of the pacemaker.

19. ⚠ **WARNING!** The warnings and cautions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

20. ⚠ **WARNING!** This product, when used for welding and similar applications, produces chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm).
(California Health & Safety Code § 25249.5, *et seq.*)

SAVE THESE INSTRUCTIONS

GROUNDING

NOTE:
This Welder requires the installation of a 3-Prong, 220 VAC, polarized, twistlock Power Cord Plug (not included)**.**
NEMA configuration # L6-50 or equivalent
The Plug must be installed by a certified electrician.

⚠ **WARNING!**

Improperly connecting the grounding wire can result in the risk of electric shock. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. Do not modify the power cord plug used with the tool. Never remove the grounding prong from the plug. Do not use the tool if the power cord or plug is damaged. If damaged, have it repaired by a service facility before use. If the plug will not fit the outlet, have a proper outlet installed by a qualified electrician.

GROUNDED TOOLS: TOOLS WITH THREE PRONG PLUGS

1. Tools marked with “Grounding Required” have a three wire cord and three prong grounding plug. The plug must be connected to a properly grounded outlet. If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user, reducing the risk of electric shock.

2. The grounding prong in the plug is connected through the green wire inside the cord to the grounding system in the tool. The green wire in the cord must be the only wire connected to the tool's grounding system and must never be attached to an electrically "live" terminal.

3. Your tool must be plugged into an appropriate outlet, properly installed ***by a certified electrician*** and grounded in accordance with all codes and ordinances.

EXTENSION CORDS

AN EXTENSION CORD MUST NEVER BE USED WITH THIS ITEM. Use of an extension cord could result in damage to the item or fire.

SYMBOLOGY

	Double Insulated
	Canadian Standards Association
	Underwriters Laboratories, Inc.
V ~	Volts Alternating Current
A	Amperes
^{no}xxxx/min.	No Load Revolutions per Minute (RPM)

UNPACKING

When unpacking both boxes, check to make sure all the parts shown on the **Parts Lists on pages 28 through 32** are included. If any parts are missing or broken, please call Harbor Freight Tools at the number shown on the cover of this manual as soon as possible.

ASSEMBLY INSTRUCTIONS

⚠ WARNING!
Always turn off the Welder and unplug the unit from its electrical outlet prior to performing any assembly, maintenance, or service.

TO ATTACH THE WHEELS

Attach the *four* Swivel Wheels (15A) at the front and at the rear of the Base (2A) of the unit, using the Bolts, Lock Washers, and Washers provided.
(See Assy. Diagram, page 28.)

TO INSTALL THE WIRE SPOOL

1. Use the Handle (5A) and lift the Door (6A) of the Welder to expose the Wire Feed Assembly. **(See Figure D.)**

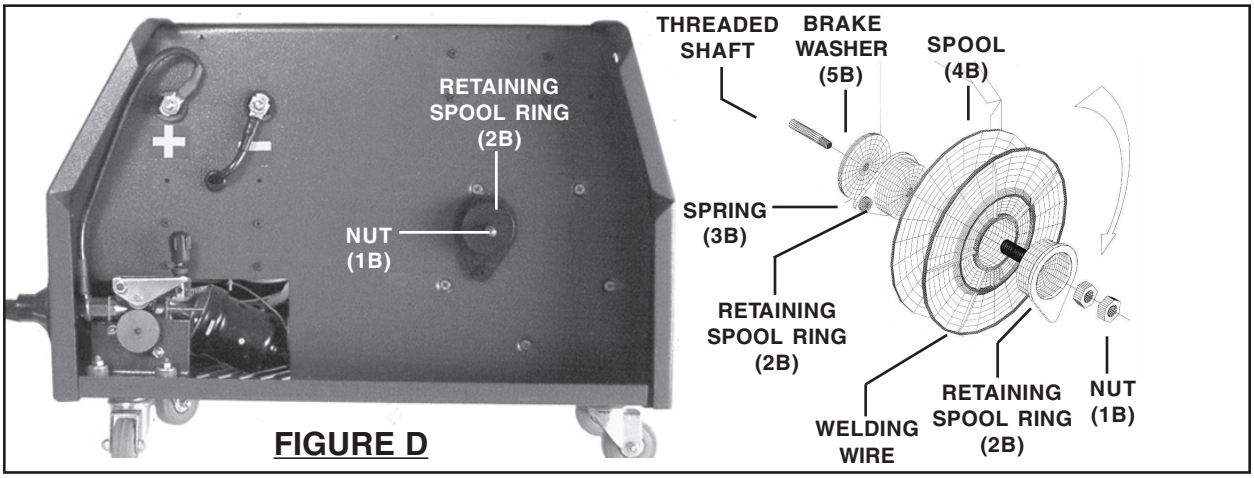


FIGURE D

2. Unscrew and remove the two Nuts (1B) from the Threaded Shaft. Then, pull out and remove the *outer* Retaining Spool Ring (2B). **(See Figure D.)**
3. Insert the Spool (4B) onto the *inner* Retaining Spool Ring (2B), **making sure the Spool's Welding Wire unwinds from the bottom (clockwise). (See Figure D.)**
4. Insert the outer Retaining Spool Ring (2B) into the Spool (4B). Then, firmly screw the two Nuts (1B) back onto the Threaded Shaft. **(See Figure D.)**

TO ROUTE THE WIRE

NOTE: When installing wire of a different size or composition, you will also need to change wire settings, set the gun polarity, and, possibly, install a gas cylinder. See pages 15-17.

1. **IMPORTANT:** Securely hold onto the end of the Welding Wire and keep tension on it during the following steps. If this is not done the Welding Wire will spring backward, creating a tangled "bird's nest" and resulting in wasted wire. **(See Figure E.)**

2. Hold the Welding Wire securely while you cut enough Wire off the end of the Spool (4B) to remove all bent and crimped Wire. Make sure the cut end has no burrs or sharp edges (cut again, if needed). **(See Figure E.)**

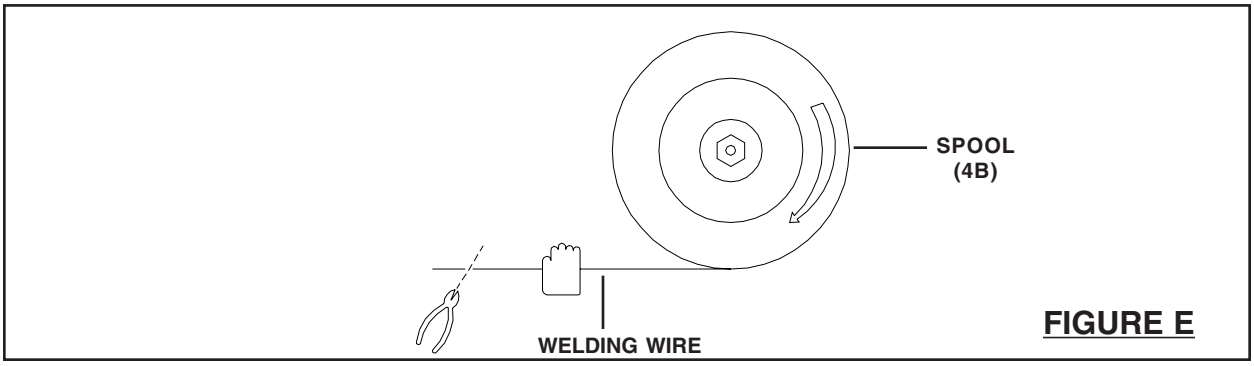


FIGURE E

3. Loosen, and lower the Handle (6.1C) on the Wire Feed Assembly. Then, raise the Lever (4C). **(See Figure F.)**

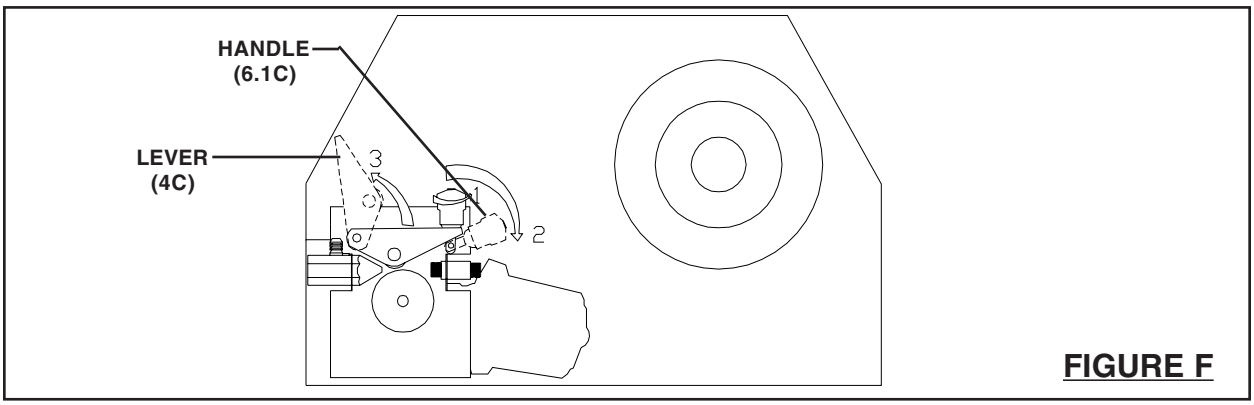


FIGURE F

4. Keep tension on the Wire, and guide at least 12 inches of Wire into the Wire Inlet Guide (3C). **(See Figure G.)**

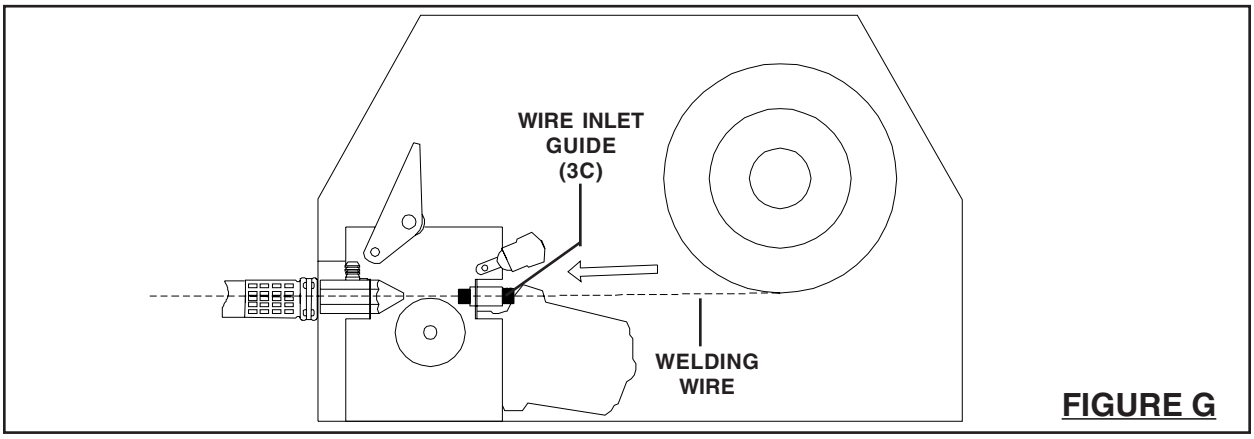


FIGURE G

5. Lower the Lever (4C) on the Wire Feed Assembly. Raise and tighten the Handle (6.1C). Once the Wire is held in place, you may release it. **(See Figure H.)**

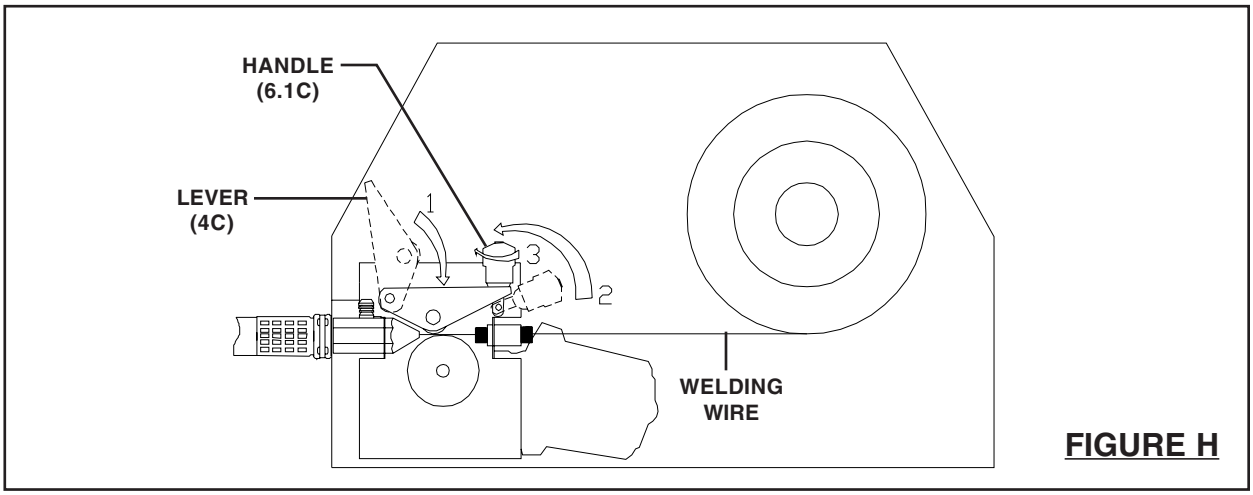


FIGURE H

6. Lay the Torch Cable out in a straight line so that the Welding Wire moves through it easily. Leave the Door (6A) of the Welder open so that the Wire Feed Assembly can be observed.

7. Remove the Gun Nozzle (1E) and Contact Tip (2E). **(See Figure I.)**

WARNING!

EXERCISE EXTREME CAUTION - RISK OF FIRE AND/OR ELECTRIC SHOCK!

The following steps require applying power to the Welder. Do not touch anything with the Torch Handle or Welding Wire or an arc will be ignited. Do not touch the internal components of the unit while it is plugged in.

8. Plug the Power Cord (1A) into its 220 volt, grounded, electrical outlet. Then, turn the Welder's Power Switch (4D) to its **"ON"** position.

9. Point the Torch Handle away from all objects. Then, squeeze the Trigger Switch (13E) on the Torch Handle until the Welding Wire feeds through the Head Tube (4E) of the Torch Handle about 2 inches. If necessary, move the Torch Handle slightly in a circular motion to help feed the Welding Wire properly out of the Head Tube. **(See Figure I.)**

10. **NOTE:** If the Welding Wire does not feed properly, and the Spool (4B) is stationary, turn the Welder off. Unplug the Welder. Slightly tighten the Handle (6.1C) on the Wire Feed Assembly, and rewind the Welding Wire slightly before retrying. **(See Figure H.)**

11. To check the tension on the Wire Feed Assembly, feed the Welding Wire against a piece of scrap wood from 2 to 3 inches away. If the Wire stops instead of bending, turn the Welder **OFF**. Unplug the unit from its electrical outlet. Then, slightly tighten the Handle (6.1C) on the Wire Feed Assembly. **(See Figure H.)**

12. **Turn the Welder OFF, unplug it, and discharge the electrode to ground.** Insert the Contact Tip (2E) onto the Welding Wire and screw it firmly into the Head Tube (4E) of the Torch Handle. Replace the Nozzle (1E), and cut off any excess Welding Wire over 1/2 inch. Then, close the Door (6A) of the Welder. **(See Figure I.)**

REMINDER: When installing wire of a different size or composition, you will also need to change wire settings, set the gun polarity, and, possibly, install a gas cylinder. See pages 15-17.

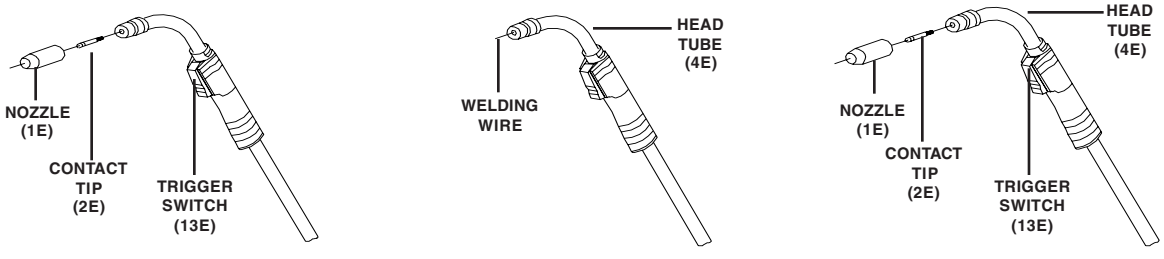


FIGURE I

TO CHANGE WIRE SETTINGS

1. ⚠ **WARNING!** Make sure to turn off the Welder and unplug it from its electrical outlet prior to changing wire settings.
2. Use the Handle (5A) and lift the Door (6A) of the Welder to expose the Wire Feed Assembly. **(See Figure J.)**
3. Loosen, and lower the Handle (6.1C) on the Wire Feed Assembly. Then, raise the Lever (4C). **(See Figure J.)**
4. Remove the Screw that secures the Roller (5C) in place. Then, remove the two Rollers. **(See Figure J.)**
5. Flip each Roller 180 degrees so that the width of the *top groove* formed by the two Rollers correspond with the diameter of Welding Wire used.
   NOTE: The two Rollers are "keyed", meaning they can only be reinstalled one way. **(See Figure J.)**
6. Reinstall the two Rollers, and secure the Rollers in place with the Screw. **(See Figure J.)**
7. Lower the Lever (4C) on the Wire Feed Assembly. Lower and tighten the Handle (6.1C).
8. Remove the Gun Nozzle (1E) and Contact Tip (2E). Install a Contact Tip that is one size larger* than the diameter of Welding Wire used. Then, replace the Gun Nozzle. **(See Figure I.)**
   *This accommodates thermal expansion of the wire.
9. Install the Spool (4B) of Welding Wire, and route the Wire to the Torch Gun. Then, test and, if necessary, adjust the Wire Feed Assembly as discussed in the previous pages of this manual.

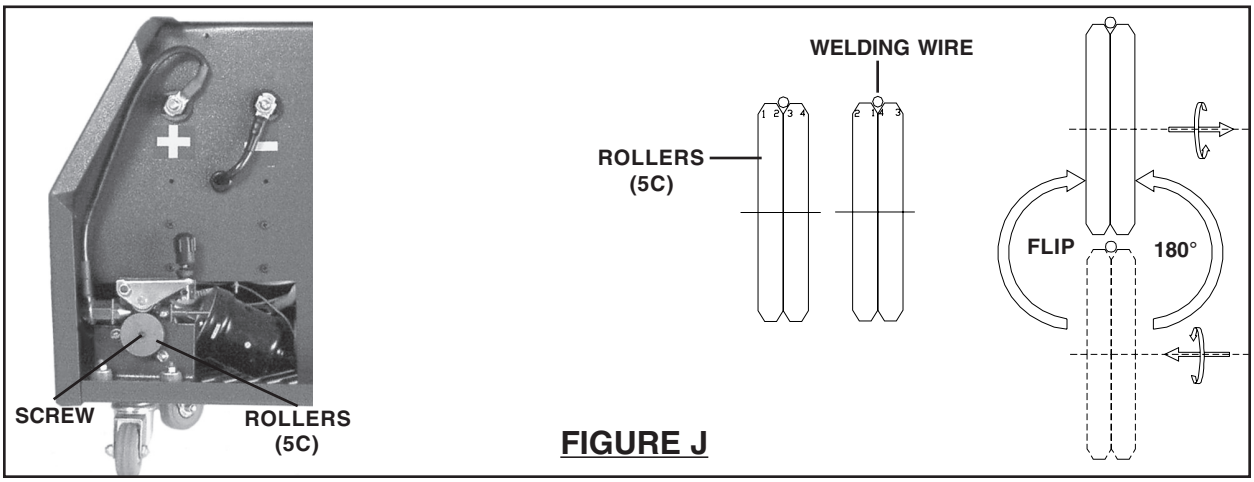


FIGURE J

SETTING THE GUN POLARITY FOR WIRE TYPE

1. Set for Electrode Positive (DCEP) for **gas welding** with solid-core wire. Red Electrode Cable (C) to Positive Terminal (A); Black Ground Cable (D) to Negative Terminal (B). **SHOWN IN ILLUSTRATION, INITIAL SETUP. (See Figure K.)**
2. Set for Electrode Negative (DCEN) for **gas-less** flux core wire. Red Electrode Cable (C) to Negative Terminal (B); Black Ground Cable (D) to Positive Terminal (A). **(See Figure K.)**
3. When connecting to the weld output terminals, do not place anything between the welding Cable Terminals (A and B) and their copper connections. **(See Figure K.)**
4. Always read and follow wire manufacturer's recommended polarity.
5. **A. Positive (+) Output Terminal**
   B. Negative (–) Output Terminal
   C. Red Cable - Electrode
   D. Black Cable - Ground

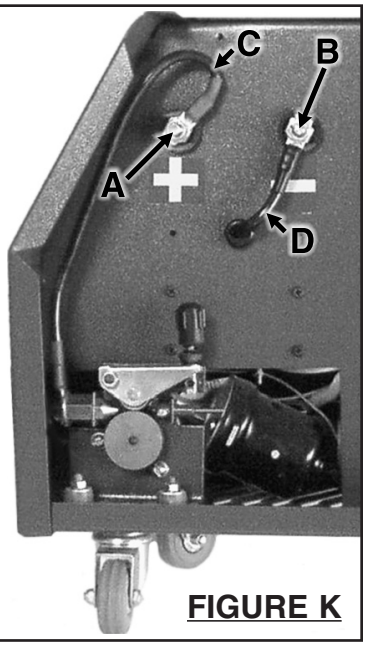


FIGURE K

TO ATTACH THE GROUND CABLE WITH CLAMP

1. Insert the bare end of the Ground Cable (11D) upward through the hole located at the rear of the Ground Clamp (11D). Then secure the bare end of the Ground Cable to the Ground Clamp, using the Bolt, Lock Washer, and Nut provided. **(See Figure L.)**
2. Insert the Connecting Plug of the Ground Cable (11D) into the Terminal Ground (10D) and twist the Connecting Plug to lock it in place. **(See Figure L.)**

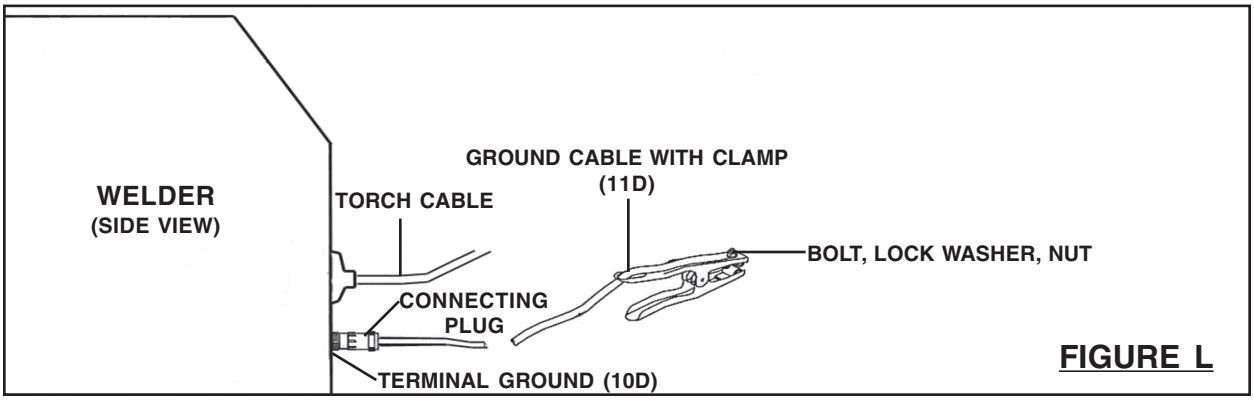
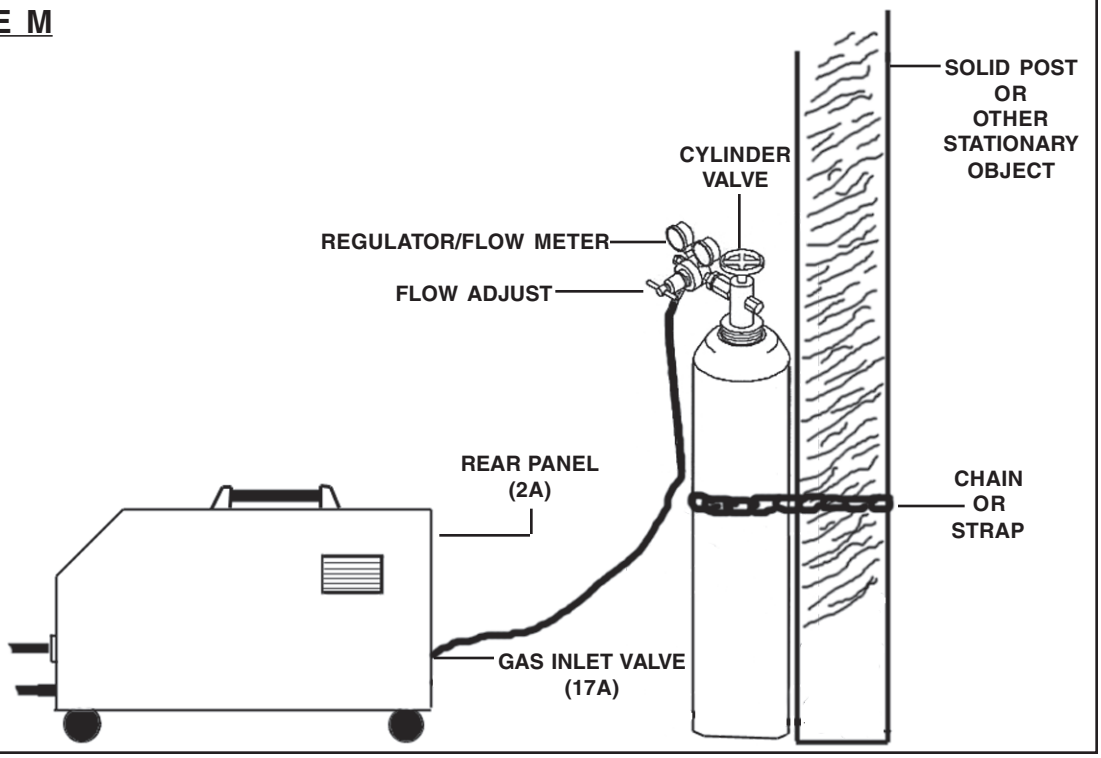


FIGURE L

TO INSTALL A GAS CYLINDER

1. **CAUTION!** Do not use an Argon/Mixed pressure regulator/flow meter with CO_2 shielding gas. To use CO_2 shielding gas, you must install a CO_2 gas pressure regulator/flow meter (neither one included).
2. With assistance, set the cylinder upright against a solid post or other stationary object and use a chain or a heavy duty strap (neither included) to secure the cylinder in place. **(See Figure M.)**
3. Remove the protective cap from the cylinder. Stand to the side of the cylinder valve, and open the valve slightly to blow dust and dirt from the valve. Then, close the valve. **(See Figure M.)**
4. Make sure the Flow Adjust on the Pressure Regulator/Flow Meter is turned off. Then, screw the Pressure Regulator/Flow Meter firmly onto the cylinder valve. **(See Figure M.)**
5. Attach the Gas Hose from the Pressure Regulator/Flow Meter to the Gas Inlet Valve (17A) located on the Rear Panel (2A) of the Welder. **(See Figure M.)**
6. Adjust the flow rate of the gas by turning the Flow Adjust. The typical flow rate is 20 cfh (cubic feet per hour). **Make sure to check the Welding Wire manufacturer's recommended flow rate. (See Figure M.)**

FIGURE M



OPERATING INSTRUCTIONS

BEFORE YOU BEGIN WELDING

Good welding requires a high degree of skill and experience. You should practice a few sample welds on scrap metal before you begin welding your first project. Additional practice periods are recommended whenever you weld a different thickness of material, wire, or weld a different type of connection.

DUTY CYCLE (DURATION OF USE)

1. **CAUTION!** Avoid damage to the Welder by not leaving the unit on for more than the prescribed duty cycle time.
2. The duty cycle defines the number of minutes, within a 10 minute period, during which a given Welder can safely produce a particular welding current. **For example, this Welder, with a 15% duty cycle at 200 Amps, must be allowed to rest for at least eight minutes thirty seconds after every minute and thirty seconds of continuous weld at 200 Amps.**
   (See Figure N.)
3. Failure to carefully observe duty cycle limitations can easily over stress a Welder's power generation system, contributing to premature Welder failure.
4. This Welder is equipped with an internal thermal protection system to help prevent over stressing the unit. When the unit overheats, it automatically shuts down, then automatically returns to service when it cools down.
   NOTE: Once the unit returns to service, follow a more conservative duty cycle routine to help prevent excess wear to the Welder. **(See Figure N.)**

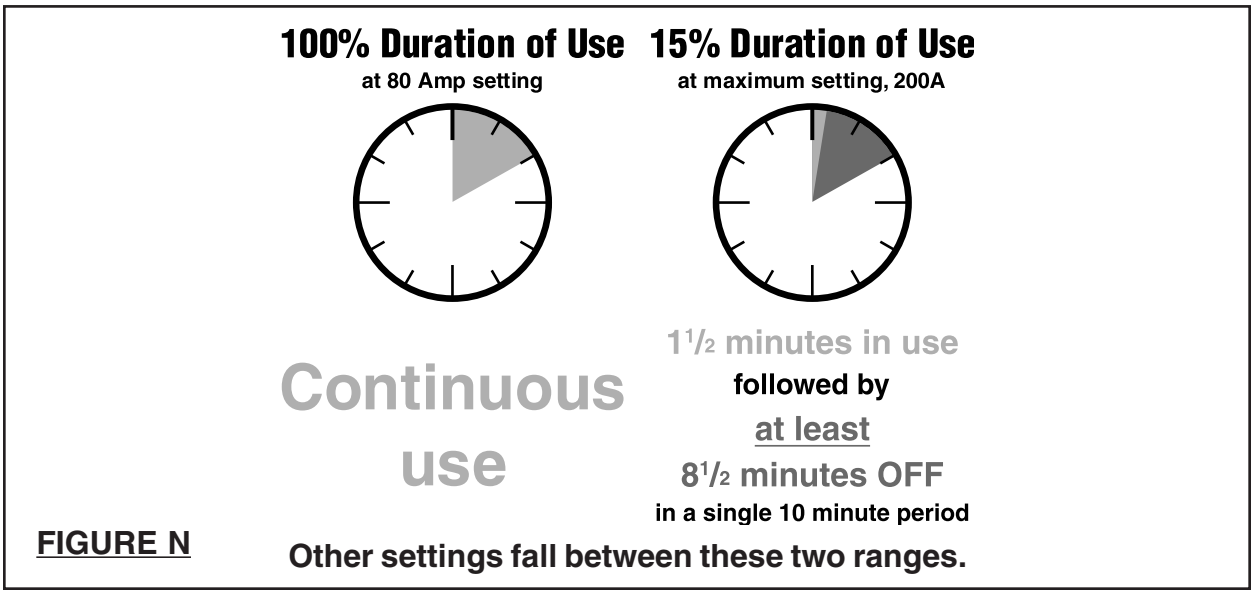

100% Duration of Use
at 80 Amp setting
15% Duration of Use
at maximum setting, 200A
Continuous use
1 1/2 minutes in use
followed by
at least
8 1/2 minutes OFF
in a single 10 minute period
Other settings fall between these two ranges.

FIGURE N

SETTING UP THE WELD

⚠ WARNING!
Before welding, make sure to read and understand all safety precautions and warnings discussed on pages 3 through 10.

1. **Power Switch (4D):** Always make sure the Power Switch is in its **"OFF"** position before plugging the Welder into a 220 volt, grounded, electrical outlet. **(See Figure P.)**

2. **Overload Protector (7D):** If too much current is drawn from the Welder, the Overload Protector will activate. The RED Overload Indicator will illuminate. And the Welder will automatically turn off until it cools down. If this happens, turn the Power Switch (4D) to its **"OFF"** position and wait approximately 3 to 5 minutes. **(See Figure P.)**

3. **Wire Feed Speed Knob (3D):** The Scale surrounding the Knob is relative value, not wire feed speed. Adjust the Wire Feed Speed Knob based on thickness of the metal being welded. **(See Figure P below, and Figure S, page 21.)**

4. **Voltage Selector Knob (2D):** The Scale surrounding the Knob is relative value, not voltage. Adjust the Voltage Selector Knob based on thickness of metal being welded. **(See Figure P below, and Figure S, page 21.)**

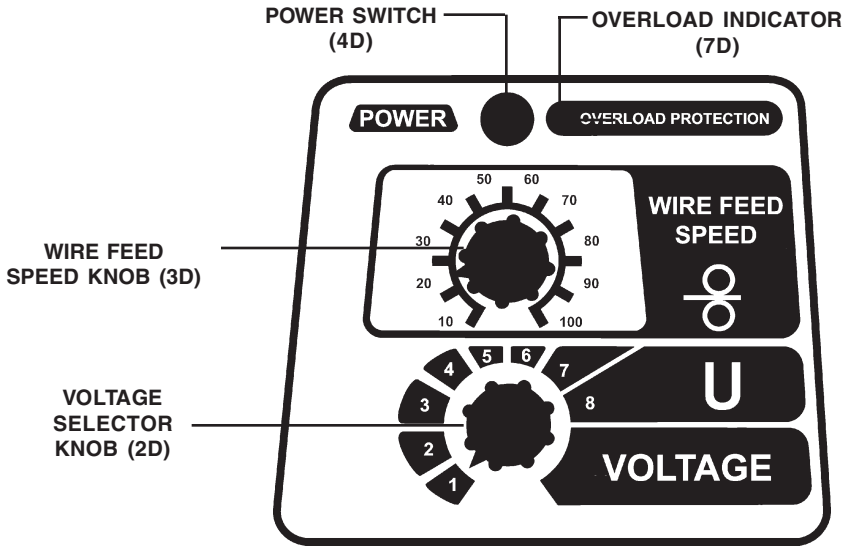


FIGURE P

5. If using solid-core wire, connect and secure an Argon/ CO_2 gas hose to the rear of the Welder. (If using flux core wire, protective gas is not required.) **(See Figure M.)**

6. Securely clamp the Ground Cable Clamp (11D) as close as possible to the metal object to be welded, or to the metal workbench where the object is mounted and electrically connected. **(See Figure L.)**

7. **NOTE:** The workpieces should be firmly held together and in position while welding. Use clamps (not included) to hold the workpieces so you can concentrate on the job

at hand. The distance (if any) between the two workpieces must be controlled properly to allow the weld to hold both sides securely while allowing the weld to penetrate fully into the joint.

8. Set the desired welding current (30 to 200 Amps) for the type/thickness of metal being welded, using the Wire Feed Speed Knob (3D) and Voltage Selector Knob (2D). **(See Figure P above, and Figure S, page 21.)**

9. Make sure the Power Switch (4D) is in its **"OFF"** position. Then plug Power Cord (1A) of the Welder into a dedicated, 220 VAC, 40 AMP line with delayed action type circuit breaker or fuse. **(See Figure P.)**

10. While holding the Welding Torch (15E), with the Welding Wire clearly out of the way of any grounded objects, turn the Power Switch (4D) to its "ON" position. **(See Figure P.)**

11. Momentarily squeeze the Trigger Switch (13E) of the Welding Torch (15E) to test the wire feed speed. If necessary, adjust the speed by turning the Wire Feed Speed Knob (3D). **(See Figure P.)**

12. Orient yourself on the area to be welded, then place a Face Shield over your eyes.

⚠WARNING! Never look at the ignited arc without ANSI-approved, arc-shaded, eye protection in a full face shield. Permanent eye damage or blindness can occur. Skin burns can occur. Never breathe arc fumes. (See page 8.)

HOLDING THE WELDING TORCH

13. Hold the Welding Torch (15E) in one hand and the face shield in the other. If a hands-free welding shield is used, then both hands can be used to control the Welding Torch.

14. The Welding Wire should be directed straight into the joint. This gives an angle of 90 degrees (straight up and down) for groove (end to end) welds, and an angle of 45 degrees for fillet (T-shaped) welds.

15. The end of the Welding Torch should be tilted so that the Welding Wire is angled anywhere in between straight on and 15 degrees in the direction of the weld. The amount of tilt is called the **"drag angle"**. **(See Figure Q.)**

16. The Welding Wire should extend no more than 1/2" past the Nozzle (1.1D) of the Welding Torch (15E). This distance is called "stickout". **(See Figure Q.)**

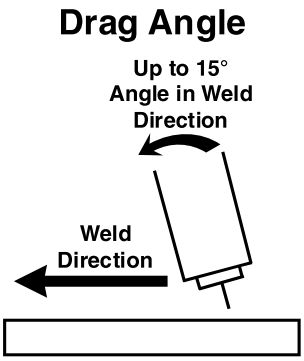


FIGURE Q

17. Set the Wire Feed Speed Knob (3D) to the recommended start setting as shown in the Weld Settings Chart on the next page. **(See Figure S.)**

WELD SETTINGS CHART

This Chart is intended to show *general* guidelines for different wire sizes and for different thicknesses of material. The settings should only be used at the beginning of a weld and must be adjusted after stopping and carefully inspecting the weld. Proper welding takes good technique and practice.

Welding Material	Shielding Gas	Electrode Polarity	Wire Type / Diameter	Position of Voltage Selector	Typical Positions of Voltage Selector and Wire Feed Speed Selector Based on Thickness of Metal Being Welded Approximate Thickness of Metal Being Welded (Columns not to scale) 24 ga.	22 ga.	20 ga.	18 ga.	16 ga.	14 ga.	12–9 ga.	1/8"–1/4"	1/4"–3/8"
					Position of Wire Feed Speed Selector								
Steel	CO_2	Positive	Steel / 0.8mm	1	40 - 60	40 - 80	50 - 90	50 - 80					
				2	40 - 60	40 - 80	40 - 80	40 - 80	40 - 80	40 - 80			
				3	40 - 60	40 - 70	40 - 80	40 - 80	40 - 80	40 - 80	40 - 80	50 - 80	
				4		40 - 70	40 - 70	40 - 70	40 - 80	40 - 80	40 - 80	50 - 80	60 - 90
				5			40 - 70	40 - 70	40 - 70	40 - 80	40 - 80	50 - 80	60 - 90
				6			40 - 60	40 - 70	40 - 70	40 - 70	40 - 80	50 - 80	60 - 90
				7					40 - 70	40 - 70	40 - 70	50 - 80	60 - 90
				8						40 - 70	40 - 70	60 - 80	70 - 90
			Steel / 1.2mm	1					50 - 60				
				2					40 - 60	40 - 60	50 - 70		
				3					40 - 60	40 - 70	40 - 70	40 - 70	
				4					40 - 60	40 - 70	40 - 70	40 - 70	40 - 70
				5						40 - 70	40 - 70	40 - 70	40 - 70
				6						40 - 70	40 - 70	40 - 70	40 - 70
				7						40 - 70	40 - 70	40 - 70	40 - 70
				8							40 - 60	40 - 70	50 - 70
	No Gas	Negative	Flux Core / 1.2mm	1					70 - 80				
				2					60 - 80	60 - 80	80 - 100		
				3					60 - 80	60 - 90	60 - 100	60 - 100	
				4					60 - 80	60 - 90	60 - 100	60 - 100	60 - 100
				5						60 - 90	60 - 100	60 - 100	60 - 100
				6						60 - 90	60 - 100	60 - 100	60 - 100
				7						60 - 90	60 - 100	60 - 100	60 - 100
				8							60 - 80	60 - 100	70 - 100
Stainless Steel	Ar	Positive	Stainless Steel / 1.0mm	1			60 - 70	60 - 70	60 - 70				
				2				50 - 70	50 - 70	50 - 70	80 - 90		
				3					50 - 70	50 - 80	60 - 100	60 - 90	
				4					50 - 60	50 - 80	60 - 100	60 - 100	70 - 100
				5						50 - 80	60 - 100	60 - 100	70 - 100
				6						50 - 80	70 - 100	70 - 100	80 - 100
				7						50 - 70	70 - 100	80 - 100	90 - 100
				8									
Aluminium			Aluminium / 1.0mm	1						70 - 80	70 - 80		
				2						70 - 80	70 - 90	80 - 90	
				3						60 - 70	70 - 90	80 - 90	
				4						60 - 70	70 - 100	70 - 100	
				5							70 - 100	70 - 100	
				6							70 - 90	70 - 100	80 - 100
				7							60 - 90	60 - 100	70 - 100
				8								60 - 70	60 - 80

Welding Instructions continued on next page.

VOLT-AMPERE CURVES

Volt-Ampere Curves show minimum and maximum voltage and amperage output capabilities of the Welder. Curves of other settings fall between the curves shown. **(See Figure O.)**

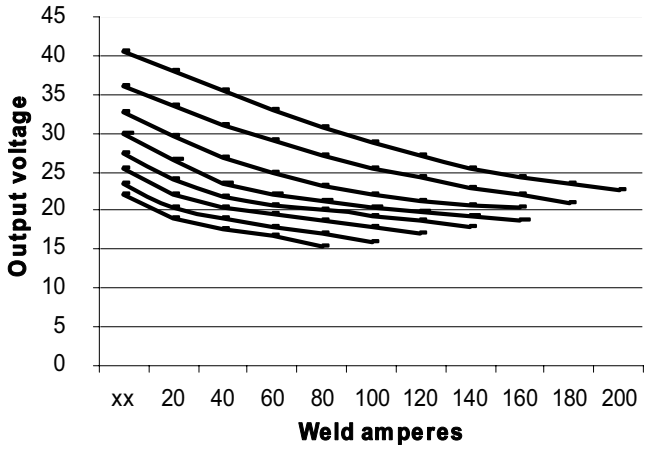


FIGURE O

18. Squeeze (and hold) the Trigger Switch (13E) of the Welding Torch (15E) and stroke the area to be welded with the Welding Wire to ignite the arc.
    - **A.** Never tap the Welding Wire into the welding surface to ignite the arc. This will cause the Welding Wire to stick to the workpiece.
    - **B.** For a narrow weld, you can usually draw the Welding Wire in a steady straight line. This is called a **"stringer bead"**.
    - **C.** For a wider weld, draw the Welding Wire back and forth across the joint in a curve. This is called a **"weave bead"**.

19. **NOTE:** If too much current is drawn from the Welder, the internal Thermal Overload Protector will activate. The Overload Indicator Light (7D) will illuminate and the Welder will automatically turn off. If this happens, turn the Power Switch (4D) to its **"OFF"** position and wait 3 to 5 minutes for the unit to cool down. **(See Figure P.)**

20. After a few seconds, stop. Switch off the Welder, and check your progress. Compare your weld's appearance with the diagrams and descriptions shown in the *"Weld Diagnosis"* section beginning on page 23. After making any necessary adjustments, continue the weld while carefully following the DUTY CYCLE guidelines. **(See Figure N.)**

Welding Instructions continued on page 25.

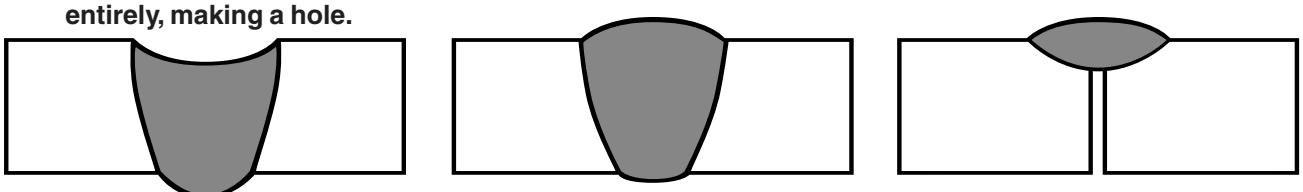
WELD DIAGNOSIS

WELD PENETRATION

EXCESS OR BURN-THROUGH
Weld droops on top and underneath, or falls through entirely, making a hole.

PROPER
Weld is visible underneath and bulges slightly on top.

INADEQUATE
Weld does not contact the joint fully, just on the surface.



CROSS SECTIONS

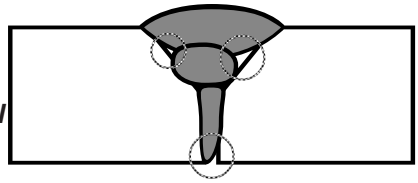
POSSIBLE CAUSES AND SOLUTIONS

1. **Excessive material at weld:**
   Reduce wire feed speed.
2. **Overheating:**
   Increase welding speed and ensure that welding speed is kept steady.

WELD NOT ADHERING PROPERLY

Gaps present between weld and previous bead or between weld and workpiece. See areas below.

CROSS SECTION



POSSIBLE CAUSES AND SOLUTIONS

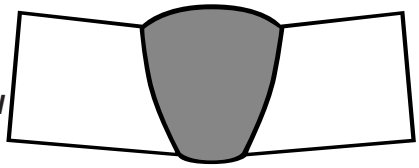
1. **Dirty workpiece:**
   Make certain that workpiece is clean and free from oil, coatings, and other residues.
2. **Insufficient weld material:**
   Increase wire feed speed.
3. **Incorrect welding technique:**
   Place stringer bead at correct place in joint.
   Adjust workpiece position or weld angle to permit proper welding at bottom of workpiece.
   Pause briefly at sides when using a weave bead.
   Keep arc on leading edge of weld puddle.
   Hold gun at proper angles as stated under Holding The Torch on page 20.

POSSIBLE CAUSES AND SOLUTIONS

1. **Workpieces too thick/close:**
   Joint design must allow weld to reach bottom of groove and allow proper welding procedures.
2. **Incorrect welding technique:**
   Maintain $^1/_2$" or less stickout.
   Keep arc on leading edge of weld puddle.
   Hold gun at proper angles as stated under Holding The Torch on page 20.
3. **Insufficient weld material:**
   Increase wire feed speed.
4. **Insufficient weld heat:**
   Reduce Welding Speed.

BEND AT JOINT

CROSS SECTION

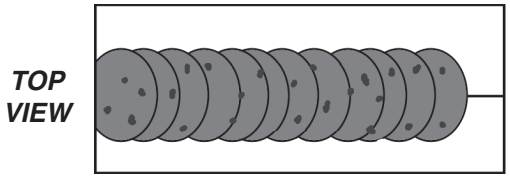


POSSIBLE CAUSES AND SOLUTIONS

1. **Improper clamping:**
   Make sure that pieces are clamped securely in place.
   Make tack welds to help hold pieces.
2. **Excessive heat:**
   Weld a small portion and allow to cool before proceeding.
   Reduce wire feed speed.
   Increase weld speed.

POROSITY

Small cavities or holes in the bead.



POSSIBLE CAUSES AND SOLUTIONS

1. **Stickout too long:**
   Reduce stickout.
2. **Dirty workpiece or welding wire:**
   Make certain that workpiece and wire are both clean and free from oil, coatings, and other residues.
3. **Insufficient gas flow at weld:**
   Increase flow of shielding gas.
4. **Dirty nozzle:**
   Clean nozzle by following the directions in the cleaning section of this manual.
5. **Wrong type of shielding gas:**
   Use only the correct welding gas for the application and wire.

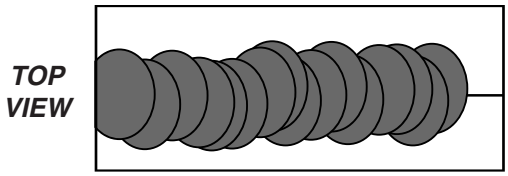
STRIKE TEST

A test weld on a PIECE OF SCRAP can be tested by using the following procedure.
WEAR ANSI GOGGLES DURING THIS PROCEDURE.

1. After two scraps have been welded together and the weld has cooled, clamp one **scrap*** in a sturdy vise.
2. Stay clear from underneath while you strike the opposite scrap with a heavy hammer, preferably a dead-blow hammer.
3. A good weld will deform but not break. A poor weld will be brittle and snap at the weld.

***This test WILL damage the weld it is performed on. This test is ONLY an indicator of weld technique and is not intended to test working welds.**

CROOKED/WAVY BEAD

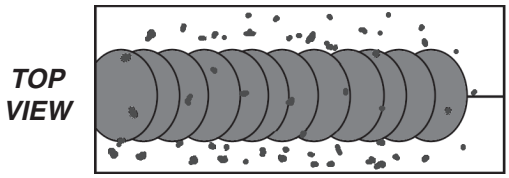


POSSIBLE CAUSES AND SOLUTIONS

1. **Stickout too long:**
   Reduce stickout.
2. **Inaccurate welding:**
   Use two hands or rest hand on steady surface.

EXCESSIVE SPATTER

Spatter that is grainy and large.
Fine spatter is normal.



POSSIBLE CAUSES AND SOLUTIONS

1. **Wire feeding too fast:**
   Reduce wire feed speed.
2. **Stickout too long:**
   Reduce stickout.
3. **Dirty workpiece or welding wire:**
   Make certain that workpiece and wire are both clean and free from oil, coatings, and other residues.
4. **Insufficient gas flow at weld:**
   Increase flow of shielding gas.
5. **Shielding gas being blown away from weld area:**
   Protect the weld area from drafts.

WHEN THE WELD IS COMPLETED

21. Lift the Welding Wire completely away from any grounded object. Set the face shield down. Then, turn the Power Switch (4D) to its **"OFF"** position. **(See Figure P.)**

22. Unplug the Power Cord (1A) from the electrical outlet. Then, make sure to set the Welding Torch (15E) on a nonflammable, nonconductive surface.

23. **NOTE:** A wire brush/hammer (not included) can now be used to clean up the weld. **CAUTION!** The weld may still be quite hot, and sparks/chips may fly when cleaning. Make sure to continue wearing ANSI-approved safety impact eye goggles and other protective wear when cleaning a weld.
    - **A.** The hammer can be used to knock off any excess spatter and to help knock down any ridges. Make sure not to damage the weld or material when striking it.
    - **B.** The wire brush can then be used to help remove oxidation and some fine spatter.

INSPECTION, MAINTENANCE, AND CLEANING

⚠ WARNING!
Before performing any maintenance on the Welder, unplug the Power Cord (1A) from its electrical outlet and allow all components of the Welder to completely cool.

1. Periodically remove the Side Panel (3A) and Door (6A) from the unit and, using compressed air, blow out all dust and debris from the interior.
2. Always store the Welder in a clean, dry, safe location out of reach of children and other unauthorized people.
3. For optimal weld quality, clean and inspect the Contact Tip (2E) and Nozzle (1E) before each use, as follows:

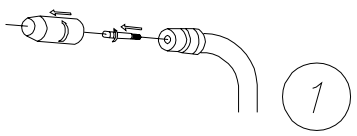
NOZZLE INSPECTION, CLEANING, AND REPLACEMENT

1. Turn the Nozzle (1E) counterclockwise while pulling to remove.
2. Scrub the interior of the Nozzle (1E) clean with a wire brush.
3. Examine the end of the Nozzle (1E). The end should be flat and even. If the end is uneven, chipped, melted, cracked, or otherwise damaged, the Nozzle will adversely effect the weld and should be replaced.
4. Reinstall the Nozzle (1E) after inspecting and cleaning the Contact Tip (2E).

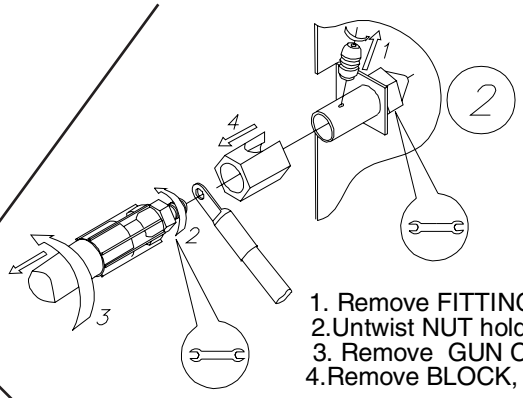
CONTACT TIP INSPECTION, CLEANING, AND REPLACEMENT

1. Make sure the entire Welding Torch (15E) is completely cool before proceeding.
2. Remove the Nozzle (1E) as explained above. Then remove the Contact Tip (2E).
3. Scrub the exterior of the Contact Tip (2E) clean with a wire brush. Check that the Contact Tip is the proper type for the wire size used.
4. Examine the hole at the end of the Contact Tip (2E) for the following problems:
   Shape: The hole should be an even circle, and should not be oblong or have any bulges in it.
   Size: The Contact Tip will decrease in efficiency as the center hole enlarges. A Contact Tip that measures 150% or more the original size* should be replaced. **(*.045" or more for .030" Tips; .035" or more for .023 Tips.)**
5. If any problems are noted with a Contact Tip (2E), it is recommended to have it replaced.
6. When inspection and maintenance is completed, reinstall the Contact Tip (2E) and Nozzle (1E).

REPLACING THE WELDING TORCH LINER

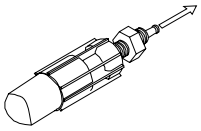


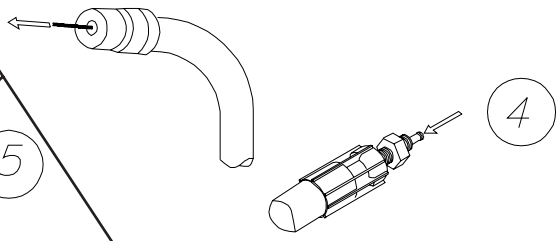
Remove NOZZLE, slip type (1E)
Remove TIP (2E)



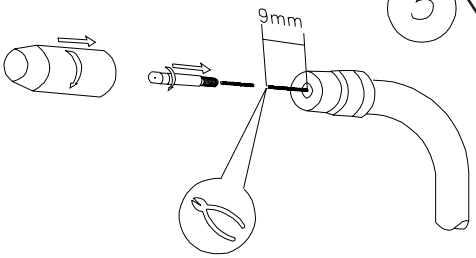
1. Remove FITTING (16C)
2.Untwist NUT holding GUIDE (14C)
3. Remove GUN CABLE
4.Remove BLOCK, CABLE with CAP

Remove LINER. (10E)

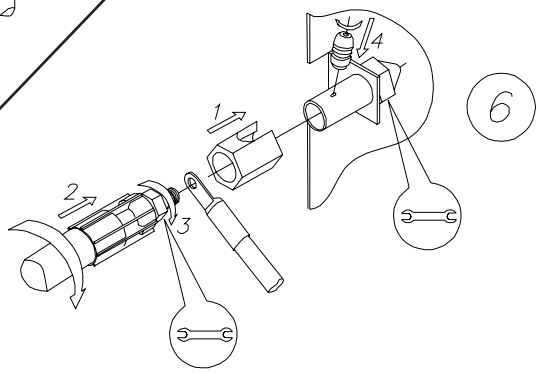




Without bending, insert a new LINER
Pull LINER out the other end



Cut LINER off 9 mm from head tube.
Install TIP (2E), NOZZLE (1E).



Install BLOCK, CABLE with CAP.
Install GUN.
Twist NUT holding GUIDE.
Install FITTING

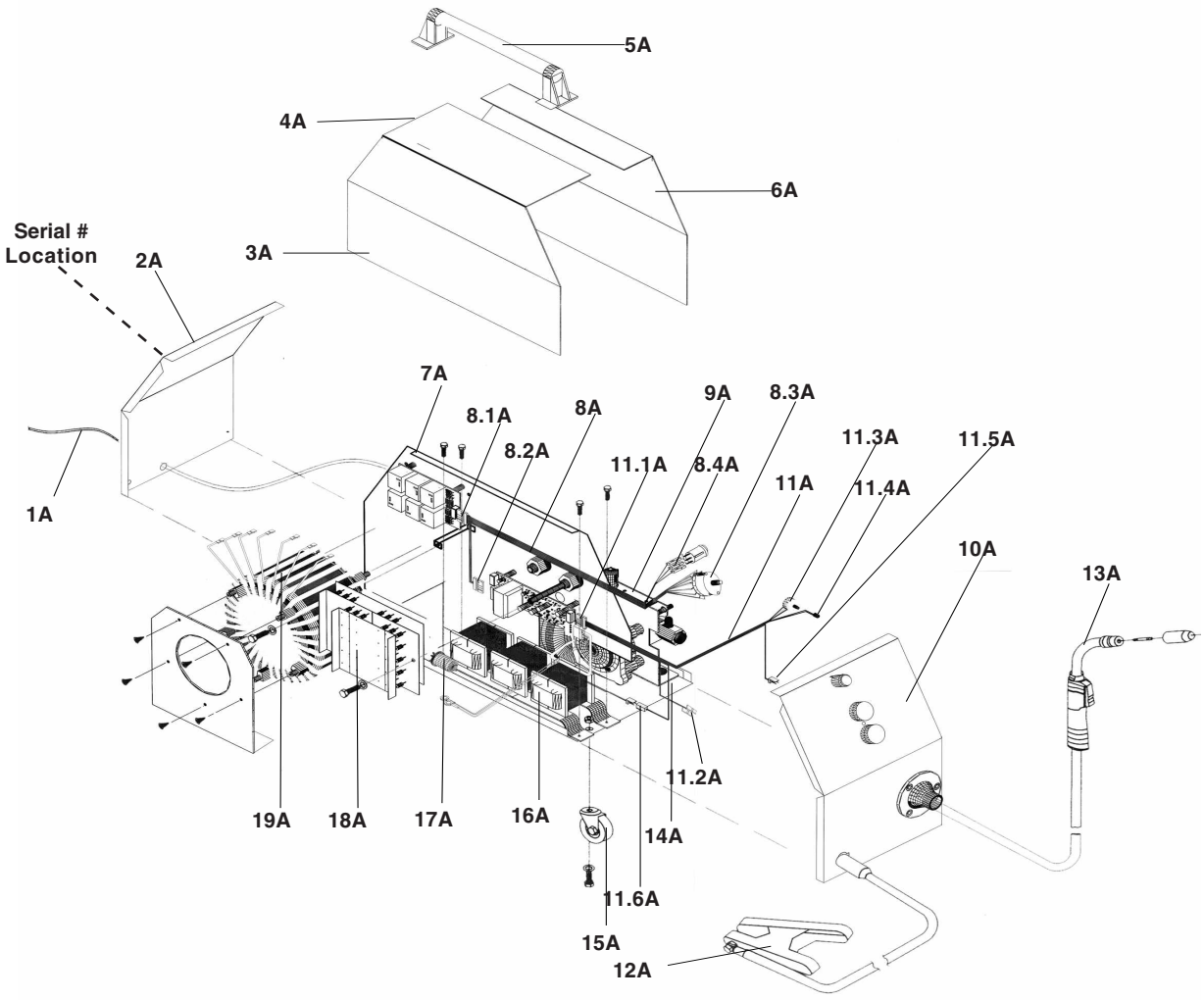
PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER NOR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

PARTS LISTS & ASSEMBLY DIAGRAMS

Part #	Description	Qty.	Part #	Description	Qty.
1A	Power Cord (8 AWGx3: 250V)	1	11.1A	Terminal (IDC-10F)	1
2A	Rear Panel/Base	1	11.2A	Terminal (Fasten: 5-160558-2/180916-0)	2
3A	Side Panel	1	11.3A	Potentiometer (16K1-B 10KKC20 Linear)	1
4A	Top Panel	2	11.4A	Overload Indicator	1
5A	Handle	1	11.5A	Terminal (WF-2)	1
6A	Door	1	11.6A	Terminal (OHU-2)	1
7A	Center Baffle	1	12A	Ground Cable w-Clamp	1
8A	Flat Cable (16)	1	13A	Gun (SB150)	1
8.1A	Terminal (IDC-16F)	1	14A	Base w/Front Pane, Rear Panel, Center Baffle	1
8.2A	Terminal (OHU-4)	1	15A	Wheel (SCgh 25)	4
8.3A	Voltage Selector Switch	1	16A	Filter Reactor w/Thermo Resistor	1
8.4A	Terminal (SG57648)	3	17A	Valve (12VAC, 2-Way Custom Port)	1
9	Wire Drive Assy.	1	18A	Rectifier	1
10	Front Panel	1	19A	Main Transformer (230V)	1
11A	Flat Cable (10)	1			

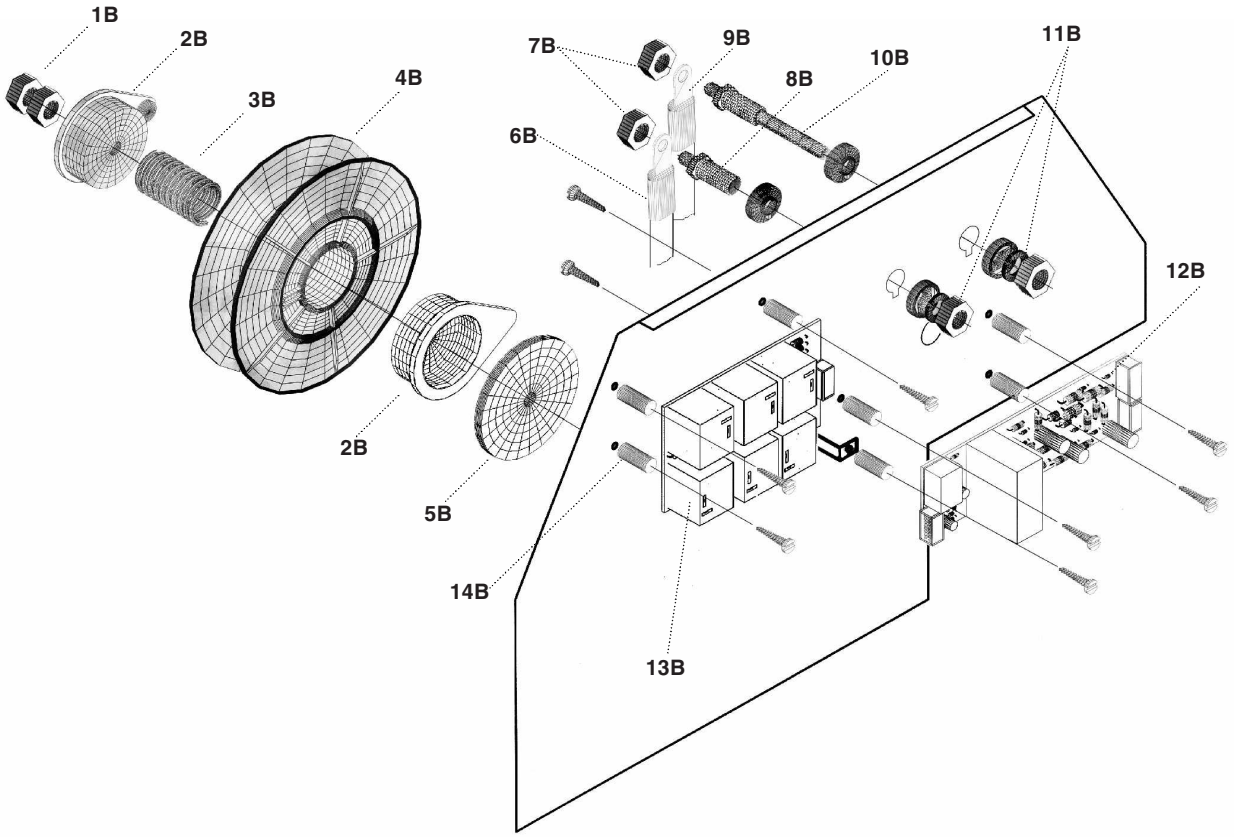
Refer to serial number (location shown below) when ordering parts for this item.



NOTE:
Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

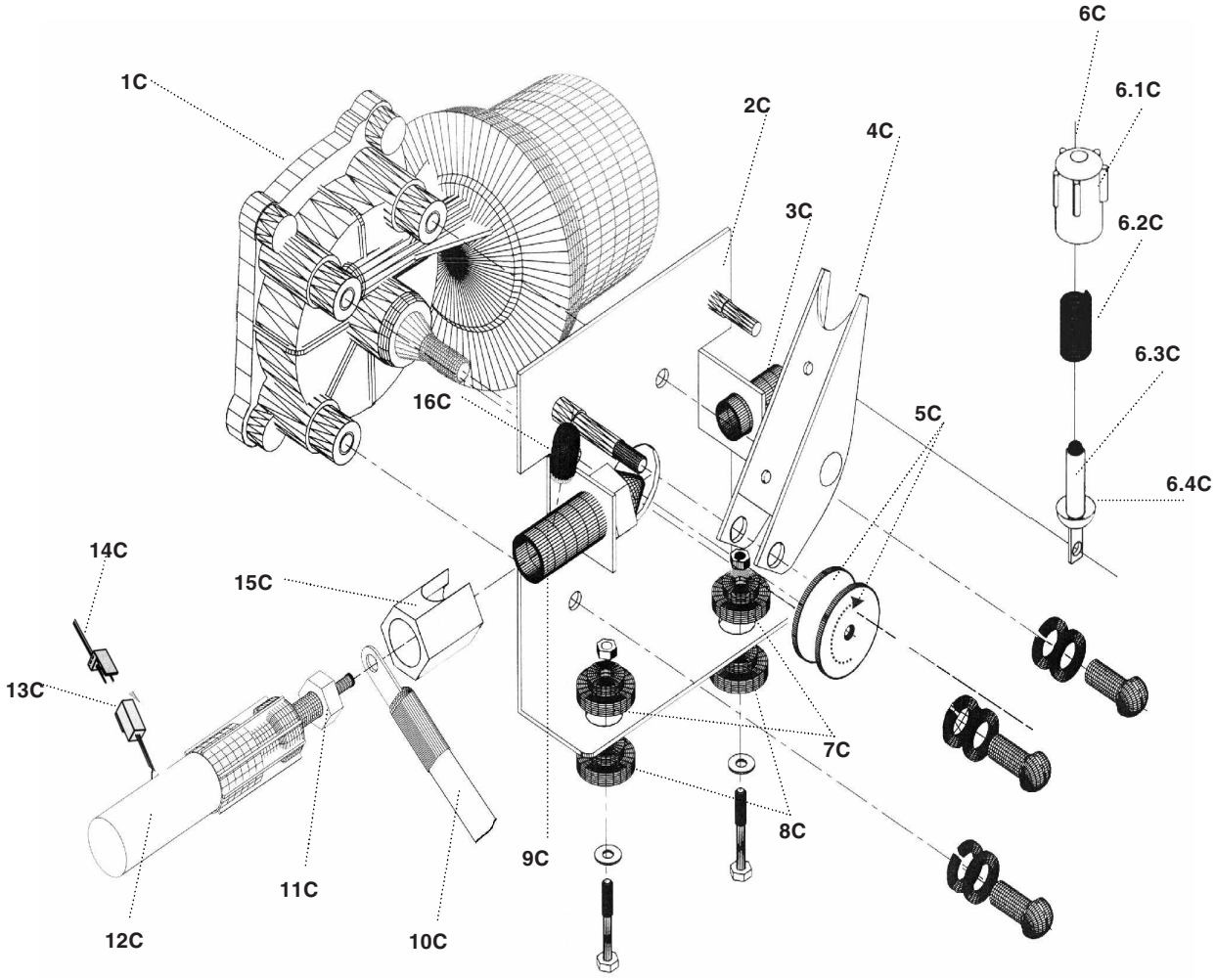
PARTS LISTS & ASSEMBLY DIAGRAMS (CONT.)

Part #	Description	Qty.	Part #	Description	Qty.
1B	Nut (M8)	2	8B	Power Terminal (Positive Output-Short)	1
2B	Retaining Spool Ring	2	9B	Cable w/Cap (Red)	1
3B	Spring	1	10B	Power Terminal (Positive Output-Long)	1
4B	Spool	1	11B	Nut (M12)	2
5B	Brake Washer	1	12B	Controller	1
6B	Cable w/Cap (Black)	1	13B	Connection Block	1
7B	Nut (M8)	2	14B	Support	8



PARTS LISTS & ASSEMBLY DIAGRAMS (CONT.)

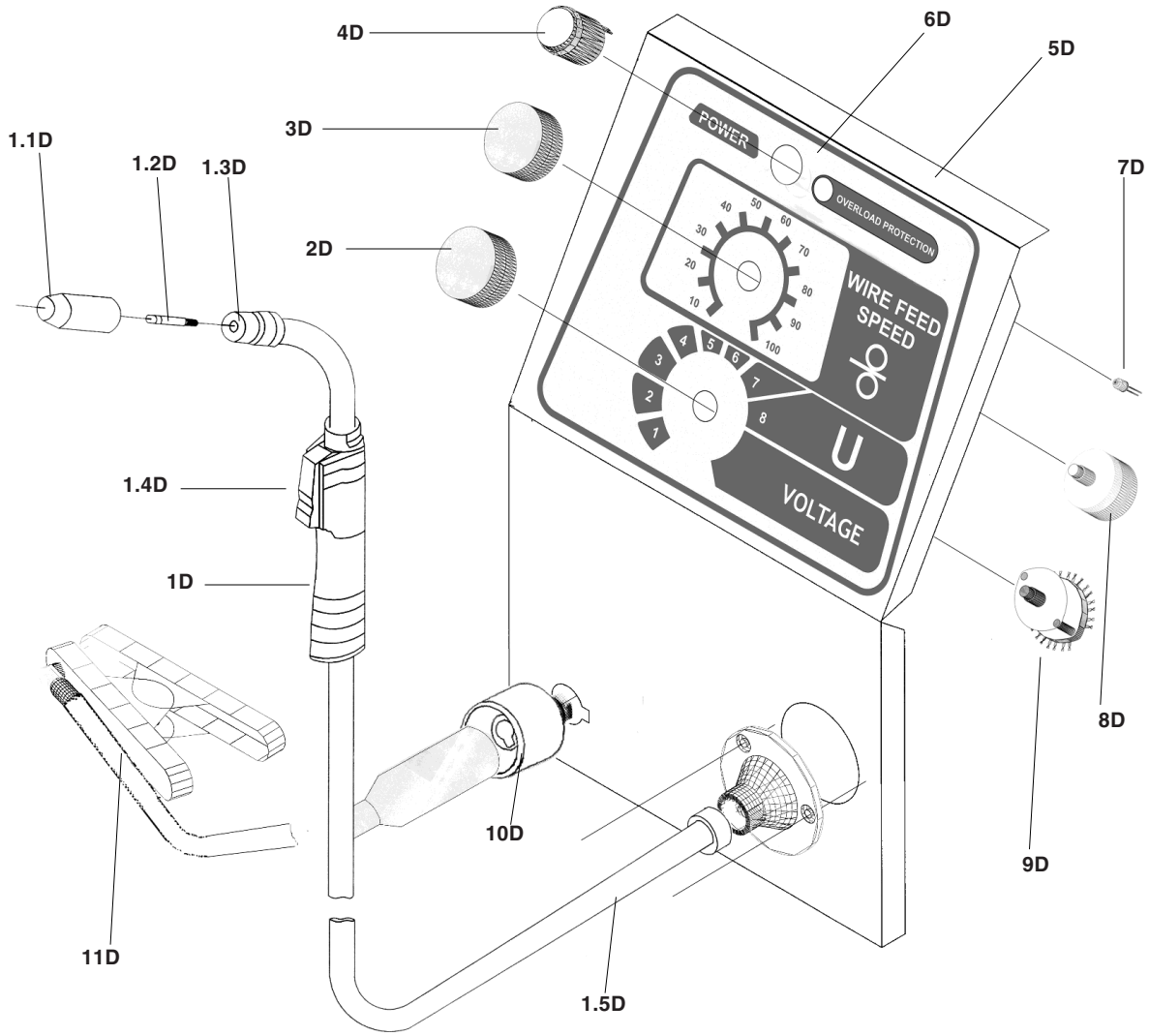
Part #	Description	Qty.	Part #	Description	Qty.
1C	Gear Motor	1	7C	Top Isolator	2
2C	Base	1	8C	Bottom Isolator	2
3C	Wire Inlet Guide	1	9C	Wire Adapter Guide	1
4C	Lever	1	10C	Cable w/Cap (Red)	1
5C	Roller	2	11C	Nut (M10)	1
6C	Drive Handle	1	12C	Gun (SB 150)	1
6.1C	Handle	1	13C	Gun Terminal (OHU-2)	1
6.2C	Spring	1	14C	Terminal (Flat Cable-10 WF-2)	1
6.3C	Axle	1	15C	Connector Gun Block	1
6.4C	Washer (Semi-Spherical)	1	16C	Fitting (Hose BRS Barbed Nipple)	1



**For technical questions, please call 1-800-444-3353;
Troubleshooting section at end of manual.**

PARTS LISTS & ASSEMBLY DIAGRAMS (CONT.)

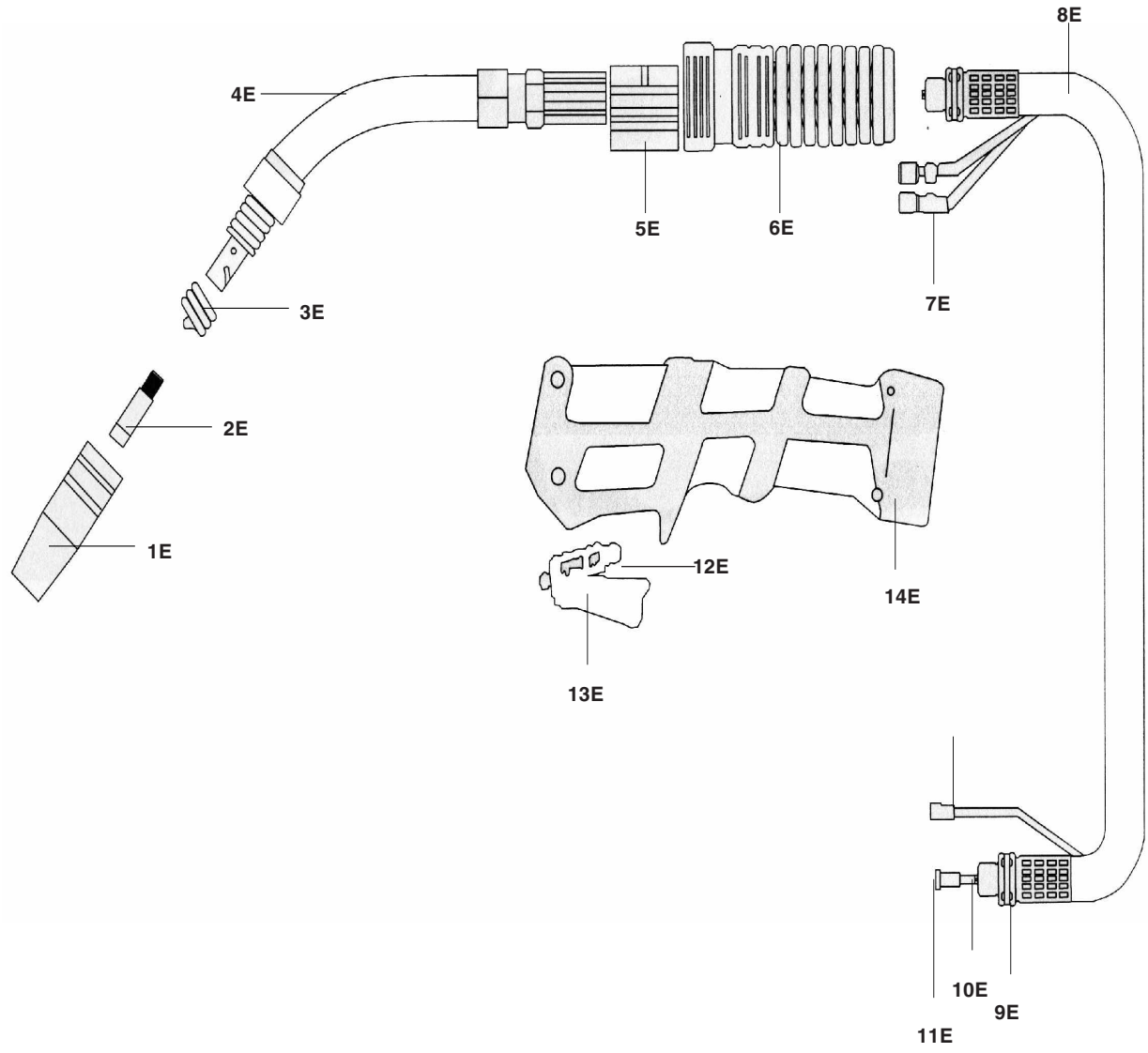
Part #	Description	Qty.	Part #	Description	Qty.
1D	Gun (SB 150)	1	4D	Power Switch	1
1.1D	Nozzle (Slip Type)	1	5D	Nameplate Label	1
1.2D	Contact Tip (0.8mm Wire)	1	6D	Front Panel	1
1.3D	Head Tube	1	7D	Overload Indicator	1
1.4D	Trigger Switch	1	8D	Potentiometer (16K1-B 10KKC20)	1
1.5D	Feeder Connector	1	9D	Switch Selector (8-Position)	1
2D	Voltage Selector Knob	1	10D	Terminal Ground (TEB-10-25)	1
3D	Wire Feed Speed Knob	1	11D	Ground Cable w/Clamp (TCB-10-25)	1



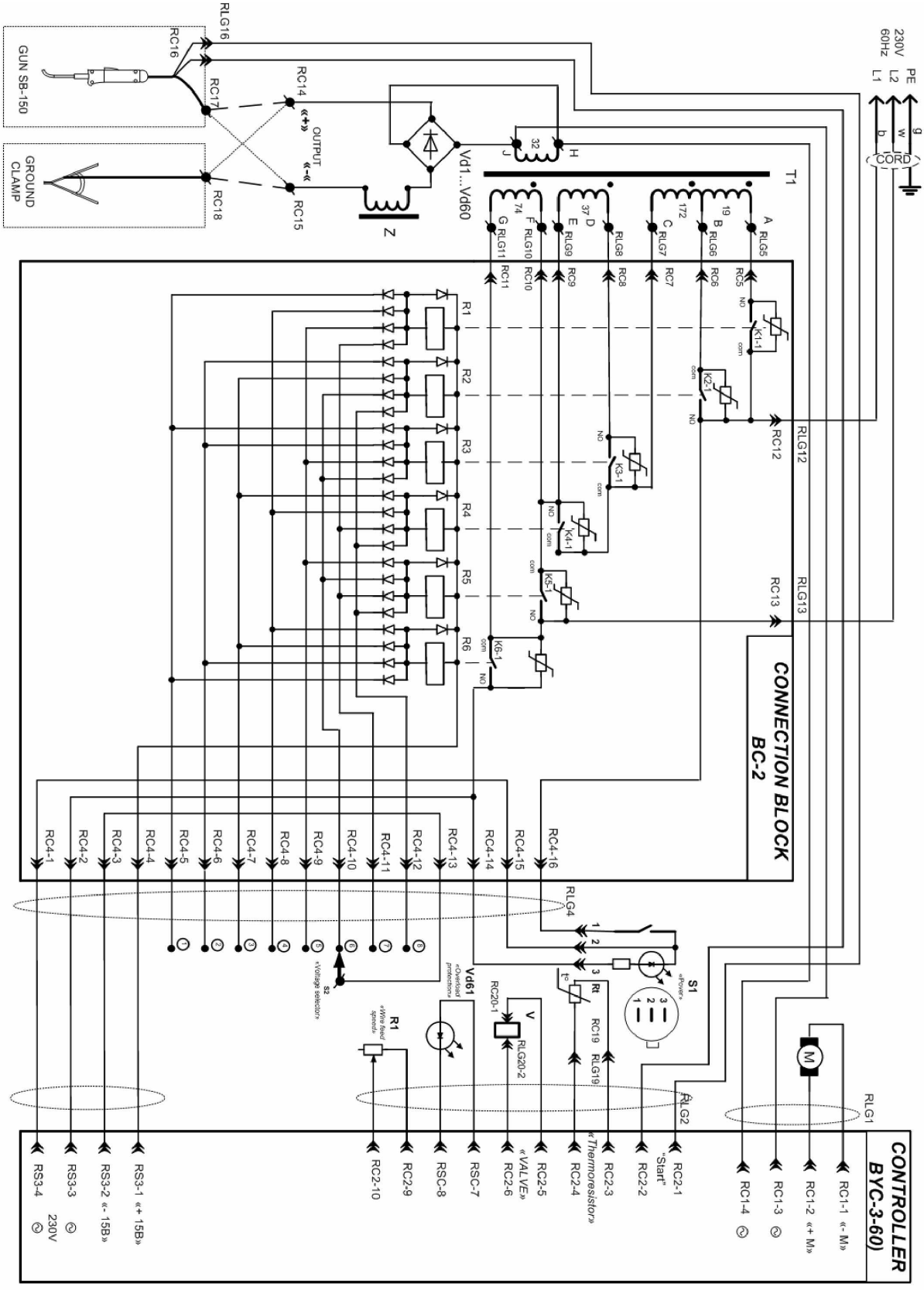
PARTS LISTS & ASSEMBLY DIAGRAMS (CONT.)

Part #	Description	Qty.	Part #	Description	Qty.
1E*	Nozzle (Slip Type)	1	9E	Nut (M12)	1
2E*	Contact Tip (0.8mm Wire)	1	10E	Liner	1
3E*	Spring	1	11E	Liner Terminal	1
4E*	Head Tube	1	12E	Switch Trigger Terminal	1
5E*	Sealant	1	13E*	Trigger Switch	1
6E*	Spring	1	14E*	Base	1
7E	Terminal	2	15E*	Complete Torch Assembly	1
8E	Feeder Connector	1			

***NOTE:**
Parts #1E*, 2E*, 3E*, 4E*, 5E*, 6E*, 13E*, and 14E* must be ordered as a Complete Torch Assembly: #15E*.



ELECTRICAL SCHEMATIC



For technical questions, please call 1-800-444-3353;
Troubleshooting section at end of manual.

TROUBLESHOOTING

IMPORTANT!

Be CERTAIN to shut off the Welder, disconnect it from power, and discharge the torch to ground before adjusting, cleaning, or repairing the unit.

WIRE FEED MOTOR RUNS BUT WIRE DOES NOT FEED PROPERLY

POSSIBLE CAUSES AND SOLUTIONS

1. **Insufficient wire feed pressure:**
   Increase wire feed pressure properly - follow instructions on page 12-13.
2. **Incorrect wire feed roll size:**
   Replace with the proper one - follow the ***Installing The Wire Spool*** instructions, starting on page 11.
3. **Damaged torch, cable, or liner assembly:**
   Have a qualified technician inspect these parts and replace as necessary.

WIRE CREATES A BIRDS NEST DURING OPERATION

POSSIBLE CAUSES AND SOLUTIONS

1. **Excess wire feed pressure:**
   Adjust wire feed pressure properly - follow instructions on page 12-13.
2. **Incorrect contact tip size:**
   Replace with the proper tip for the wire size used.
3. **Gun end not inserted into drive housing properly:**
   Loosen gun securing bolt and push gun end into housing just enough so that it does not touch wire feed mechanism.
4. **Damaged liner:**
   Have a qualified technician inspect and repair/replace as necessary.

WELDING ARC NOT STABLE

POSSIBLE CAUSES AND SOLUTIONS

1. **Wire not feeding properly:**
   See first ***Troubleshooting*** section above.
2. **Incorrect contact tip size:**
   Replace with the proper tip for the wire size used.
3. **Incorrect wire feed speed:**
   Adjust wire feed speed to achieve a more stable arc.
4. **Loose torch cable or ground cable:**
   Check to ensure that all connections are tight.
5. **Damaged torch or loose connection within torch:**
   Have a qualified technician inspect and repair/replace as necessary.

If the steps above do not solve the problem or if the repairs involved are too complex, contact a qualified technician.

IMPORTANT!

Be CERTAIN to shut off the Welder, disconnect it from power, and discharge the torch to ground before adjusting, cleaning, or repairing the unit.

WELDER DOES NOT FUNCTION WHEN SWITCHED ON

POSSIBLE CAUSES AND SOLUTIONS

1. **Tripped thermal protection device:**
   Shut the welder's switch to off and allow it to cool for at least 20 minutes.
   Reduce duration or frequency of welding periods to help reduce wear on the welder.
   Refer to ***Duty Cycle*** section on page 18.
2. **Faulty or improperly connected Trigger Switch (1.4D):**
   Have a technician check and secure/replace Trigger Switch (1.4D).
3. **Internal fuse blown:**
   Have a qualified technician check/replace.

WEAK ARC STRENGTH

POSSIBLE CAUSES AND SOLUTIONS

1. **Incorrect line voltage:**
   Check the line voltage and, if insufficient, have a licensed electrician remedy the situation.

WIRE FEEDS, BUT ARC DOES NOT IGNITE

POSSIBLE CAUSES AND SOLUTIONS

1. **Improper ground connection:**
   Make certain that the workpiece is contacted properly by the Ground Clamp and that the workpiece is properly cleaned near the ground clamp and the welding location.
2. **Improperly sized or excessively worn Contact Tip (2E):**
   Verify that Contact Tip (2E) is the proper size for the welding wire used. Check that the hole in the tip is not deformed or enlarged. Also, check that the tip is not dirty; this would prevent a good connection. If needed, replace Contact Tip (2E) with proper size and type.

IMPORTANT!

Be CERTAIN to shut off the Welder, disconnect it from power, and discharge the torch to ground before adjusting, cleaning, or repairing the unit.

WIRE FEEDS, BUT SHIELDING GAS DOES NOT FLOW

POSSIBLE CAUSES AND SOLUTIONS

1. **Empty Gas Cylinder:**
   Check gas cylinder.
2. **Nozzle Plugged:**
   Clean nozzle. If damaged, replace.
3. **Regulator or cylinder valve closed:**
   Make sure both valves are adjusted properly.
4. **Gas line blocked:**
   Check external hose, and hose within Torch cable.
5. **Gas solenoid broken or not connected properly:**
   Have a qualified technician check/replace.

WARRANTY

CHICAGO ELECTRIC® welding systems

LIMITED 1 YEAR/90 DAY WARRANTY

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that for a period of ninety days from date of purchase that the torch, liner, wire feed mechanism (if applicable), welding clamps, electrode holders, cables and accessories packed with the welder are free of defects in materials and workmanship. **This Limited 1 Year/90 Day Warranty shall not apply to consumable parts such as tips, welding wire, and gas nozzles.** Harbor Freight Tools also warrants to the original purchaser, for a period of one year from date of purchase, that the transformer and rectifier are free from defects in materials and workmanship. This warranty does not apply to damage due directly or indirectly to misuse, abuse, negligence or accidents; repairs or alterations outside our facilities; or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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If the steps above do not solve the problem or if the repairs involved are too complex, contact a qualified technician.